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FOR HEALTH AND
MILITARY PERFORMANCE



Nutrient Timing



Overview



- **Fatigue and glycogen depletion**
- **“Staleness” and overtraining**
- **Nutrient timing**
- **Glycemic Index**
- **Optimum recovery foods**
- **Calculating CHO intake**

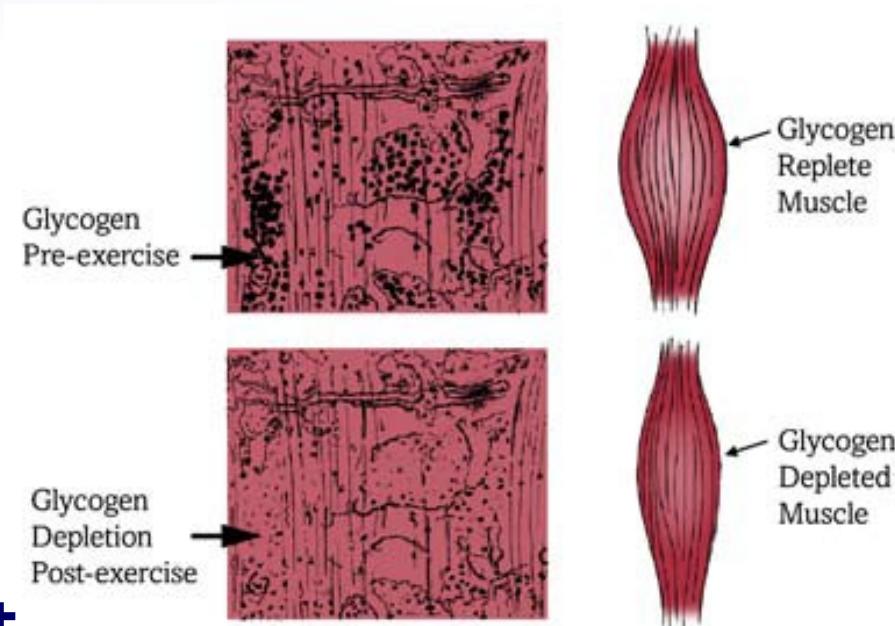




Fatigue and Glycogen Depletion



- **Glycogen depletion causes fatigue**
- **Fatigue causes failure**
- **All strenuous activity, exercise or missions, will deplete glycogen**
- **Muscle glycogen can be replenished through proper diet and nutrient timing**





“Staleness” and Overtraining



- **Unexplained and persistent poor performance**
- **Moodiness, fatigue, depression, and irritability**
- **Painful muscles**
- **Insomnia**
- **Weight loss**
- ☒ **↑ heart rate**
- **Overtraining**
- ☒ **↑ susceptibility to overuse injuries, colds and GI problems**



Training Distress Scale

Staleness Scoring

Please respond to the following items as to how you have been feeling the last week, including today. Insert the number for each item that best describes you in the "Score Column". If you score over 14 for at least 3 days, you should consider taking a break from heavy training for two days and get a few good nights of sleep, IF POSSIBLE. Courtesy of Dr. Jack Raglin

	Not at all	A little	Moderately	Quite a bit	Extremely
Friendly	0	1	2	3	4
Worthless	0	1	2	3	4
Miserable	0	1	2	3	4
Helpful	0	1	2	3	4
Bad-tempered	0	1	2	3	4
Guilty	0	1	2	3	4
Unworthy	0	1	2	3	4
Peeved	0	1	2	3	4
Cheerful	0	1	2	3	4
Sad	0	1	2	3	4



The Remedy



- **Rest**
- **Balanced meals**
- **Adequate fueling before and after exercise**
- **Stable body weight**





Nutrient Timing



- The timing of “when” nutrients are consumed is AS important as “what” nutrients are consumed
- The critical “refueling interval” or RFI is within 45 minutes after exercise
- A combination of CHO (40 - 50 grams) and protein (10 - 13 grams) should be consumed

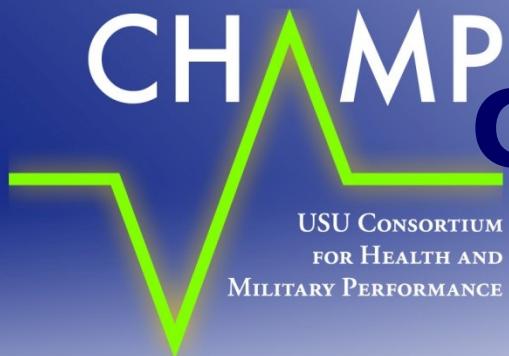


Phases of

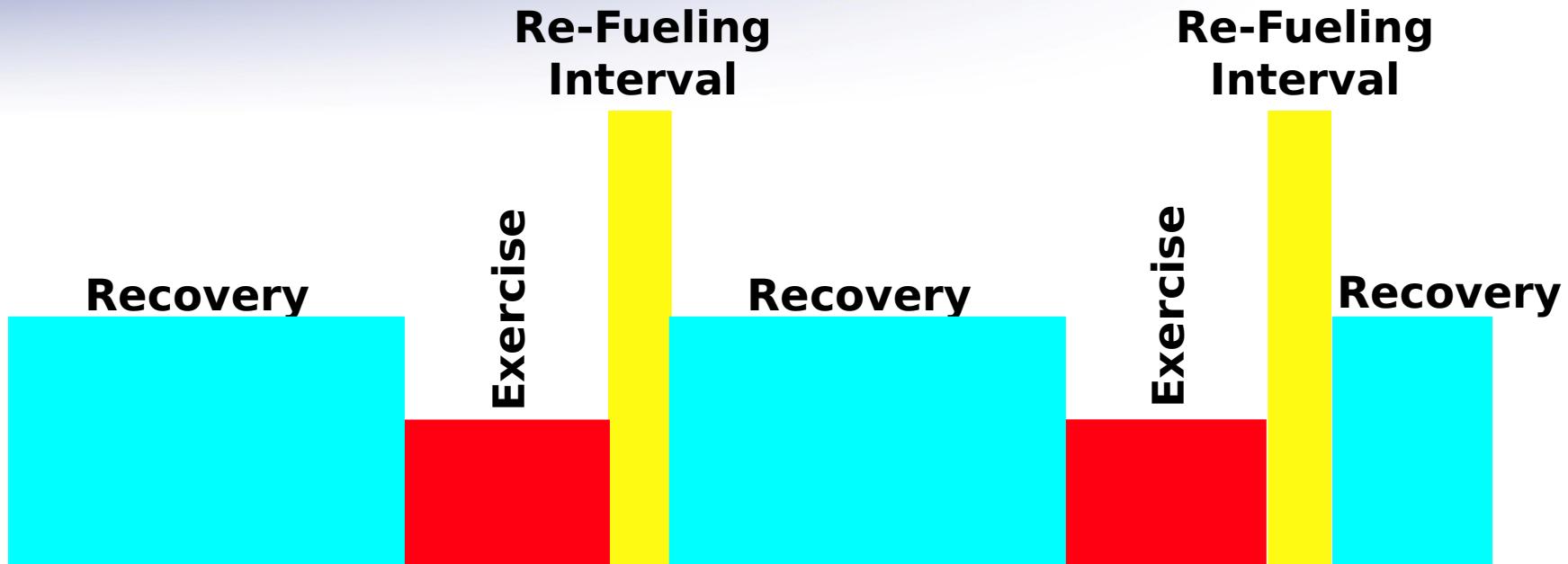
Nutrient Timing



- **Recovery or Maintenance**
 - Good food choices must be made throughout recovery/maintenance phase when muscle growth and tissue repair are needed.
- **Exercise period**
 - Fluids, CHO and electrolytes
- **Re-Fueling Interval (RFI)**
 - Critical period after exercise
 - Within 45 minutes post-workout



Critical Re-Fueling Interval



Phases of Timing Nutrient Intake

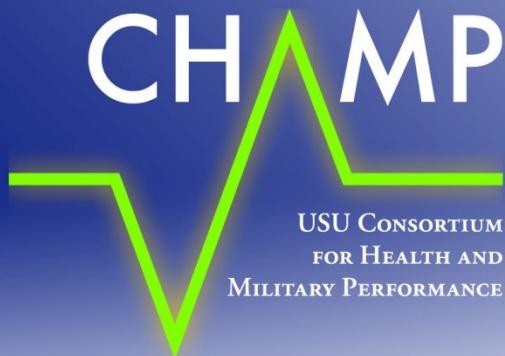


Exercise “Environment”



- **Exercise is “catabolic”**
 - Energy used by working muscles
 - Microtears in muscles
- **Recovery is “anabolic”**
 - Recovery builds up what was lost
 - *Insulin is a key hormone*
 - *CHO and protein are key stimuli*
- **An “empty tank” after exercise or strenuous ops will be detrimental to next day performance**

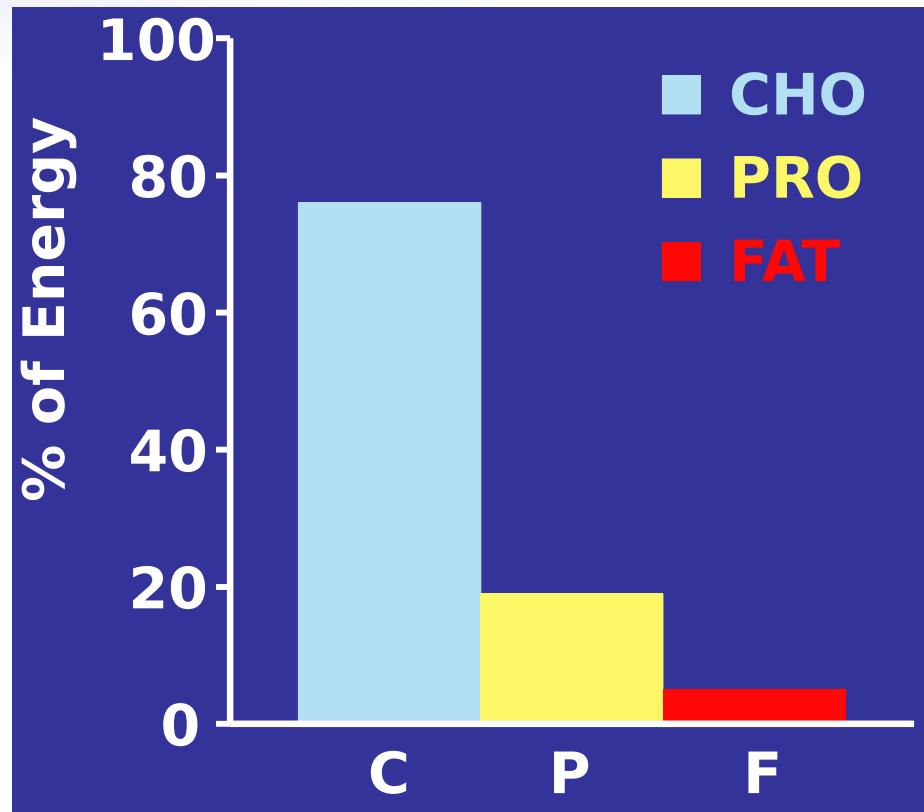




Ideal Recovery Ratio



- **CHO/PRO/FAT or CPF**
 - **78/18/10**
 - **Replenish glycogen stores**
 - **Prevent fatigue**
- **Pay attention to Glycemic Index or “GI”**





Glycemic Index (GI)



- **Glycemic Index (GI): Ranking of CHO based on blood glucose response to a reference food**
 - High GI produce rapid “spike” in glucose
 - Low GI produce slow, sustained increase
- **Immediately after mission: HIGH GI**
 - Carrots, raisins, corn flakes, breads, rice cakes
- **Recovery and maintenance: LOW GI**
 - Yogurt, apples, dried fruit, lentils, beans

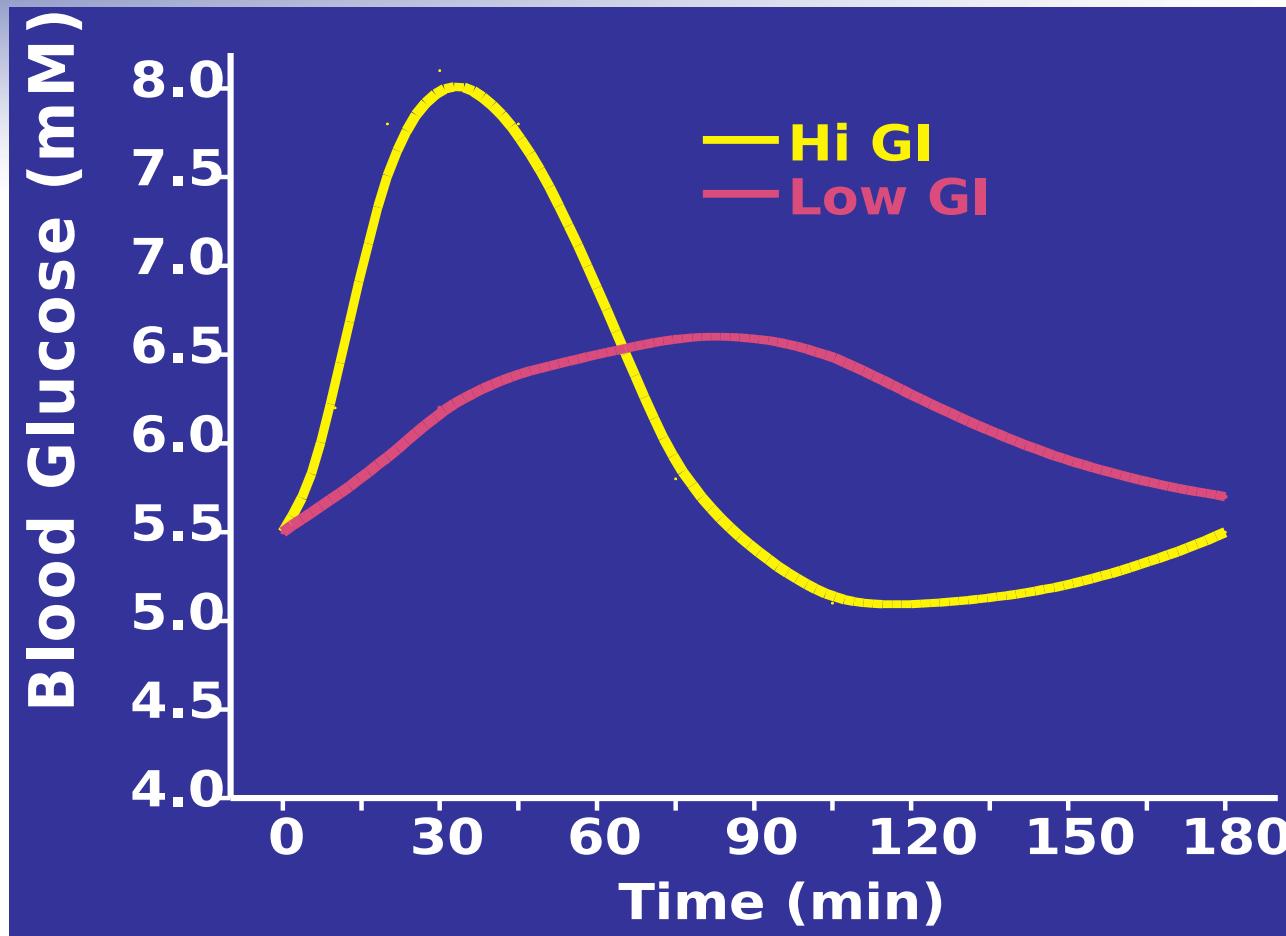
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Glycemic Responses



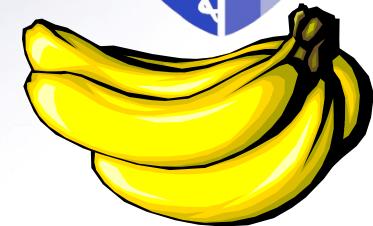
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to Foods





Glycemic Index of Foods



GI > 85

- **White Bagel**
- **English Muffins**
- **Doughnut**
- **Raisins**
- **Corn Chips**
- **Ice Cream**
- **Sports Drinks**

GI < 60

- **Yogurt**
- **Grapefruit/Oranges**
- **Beans**
- **Peanuts**
- **Apples/Banana/Plums**
- **Milk**
- **Brown Rice**

<http://www.glycemicindex.com/>



Recovery (RFI) Meals



Food/Beverage Products	CHO (g)	Pro (g)
Peanut butter, 2 Tbsp, and jelly, 2 tsp, on wheat bread, 2 slices	43	14
Wendy's Mandarin Chicken Salad and Cranapple juice, 8 oz	88	27
Hard-boiled egg, 1, and bagel	56	12
Hand-Tossed Style Chicken Supreme Pizza (Pizza Hut), 1 slice, and juice, 8 oz	57	13
Subway Breakfast Western Egg with Cheese on Deli Roll with orange juice, 4 oz	47	28



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Recovery (RFI) Meals



Food/Beverage Products	CHO (g)	Pro (g)
Taco Bell Bean Burrito, 1	54	13
Low-fat yogurt with fruit, 8oz	47	11
Soldier Fuel Bar, 1, or other high CHO Sports Bar	40	10
String cheese, 2, and apple or pear, 1 large	23	14
Cereal with low-fat milk, 1 cup	53	13
McDonald English Muffins with Jam, 2	36	5
Arby's Jamocha Shake, regular size	81	11

Calculating CHO Intake



Calculating CHO Intake AFTER

Enter your weight in pounds



155 lbs

30 g every 30 minutes

or

240 g divided over 4 hrs



CPF Meal Planning



- **Chicken, rice, and vegetables**
- **Cereal, milk, and fruit**
- **Turkey on whole grain bread with vegetables**
- **Low-fat yogurt, grape nuts and fruit**
- **Vegetable burrito (*tortilla, vegetables, and cheese*)**





Key Points



- Nutrient timing is critical to performance
- Refueling Interval (RFI) is within 45 min after a workout
- High GI foods are ideal for recovery
- Protein added to recovery meal helps muscle rebuilding
- Sports bars, gels, and drinks are suitable for SOF missions

